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Scientific Abstracts

An Anesthesiologist Looks at Monitoring

Harmel, Merel H. Ann. New York Acad. Sci. 118:435-438 Nov. 1964

Monitoring of a patient's physiologic function dates from the time the first physician felt a pulse and followed its rate and rhythm or observed respiratory activity, recording the rates. Anesthesiologists have used simple monitoring of pulse and respiratory rate and, since the time of Harvey Cushing, sphymomanometry. Technological developments recently have brought a greater degree of sophistication to the concept of monitoring, especially as it concerns anesthesiologists.

Monitoring is directed to providing the means for moment-to-moment observation of the patient's status, so that untoward changes in normal function can be evaluated and treated. Monitoring is usually initiated in the operating room, but the desperately ill patient should be monitored at all times. Pulse, blood pressure, blood flow, cardiac output, respiration, pCO_2, pH, electrical activity of heart and brain, temperature, and skin resistance are physiologic functions now amenable to display and recording. Factors relevant to the patient's problem must be selected for monitoring to alleviate the problems of logistics associated with the interpretation of findings collected from several patients in recovery or intensive care units.

The future of monitoring seems to lie in the development of radio-telemetry. Desirable characteristics include: small, self-contained transmitters; conventional, inexpensive components; no requirement for special licenses; no external antenna and low power requirement; no explosion or shock hazard, flawless reproduction of the physiologic signal; provision for rechargeable battery; sterilizable transmitters; inexpensive receiving equipment, which would also drive conventional recording devices, and over-all simplicity of the entire system. The use of radio-telemetry must not add problems.

The danger in any view that looks toward universal monitoring of physiologic functions is that great reliance must be placed on instrumentation with the result that the art of using one's head and hands is lost. Monitoring is designed to aid, not replace, human judgment.

Another disadvantage found was muscle rigidity of the thorax and abdominal wall during induction. This was controlled by intravenous administration of succinylcholine. Liver function was not affected.

This technic, called neuroleptanalgesia, is a new approach to anesthetic management of surgical patients. The method deserves further study.

Operative Dentistry Under General Anesthesia

Tocchini, John J. J. California V. A. 41:15-19 Feb. 1965

General anesthesia should not be used routinely for operative dentistry. Because of the inherent risk involved, use of a general anesthetic should be limited to patients who are physically or mentally handicapped, emotionally or psychologically disturbed, or highly excitable or uncooperative, or when they are very young and have rampant caries.

Treatment of these patients should be attempted without sedation. If this fails, sedation should be given, with or without local anesthesia. Only if this fails should a general anesthetic be given.

General anesthesia is always a major procedure. The hazards of operative or exodontic procedures are superimposed on the hazards of general anesthesia.

During a general anesthetic process, the most hazardous stage is that of induction and extubation. If possible, all the procedures necessary in treatment of the patient should be performed during one treatment session in the hospital.

The patient must be carefully evaluated by the dentist before the hospital treatment. The patient's physician should be consulted and prescribed laboratory tests must be completed before treatment begins.

The skill and competence of the anesthesiologist are of great importance to patient safety. Administration of general anesthetics should not be left to untrained professional assistants.

Treatment requires that a complete oral examination be made before any corrective measures are taken. A complete medical history is necessary. All procedures requiring general anesthesia should be performed in a hospital.

(The article concludes with a step-by-step outline of hospital admission and dismissal procedures.)

Methohexital in Conjunction with Regional Anesthesia

Meagher, Ronald P. Anesth. & Anal. 43:679-686 Nov.-Dec. 1964

Regional anesthesia permits good operating conditions for the surgeon while causing minimal physiologic disturbance to the patient. The patient is usually kept in light preoperative sleep or in a hypnotic state, both induced by premedication and continued by drug therapy during surgery.

A barbiturate with a very short duration has been introduced for continuous use during surgery with minimal hazard of overdosage. This drug, methohexital (Brevital), has been used in a double-blind study involving 800 patients.

One group of 400 patients received 0.6% thiamylal, 0.6% thiopental, or 0.2% methohexital in continuous infusion after oral pentobarbital premedication and intramuscular morphine sulfate or demerol injections. The other 400 patients were given 0.2% methohexital without any other barbiturate. Both groups had surgery with regional anesthesia.

Methohexital provided a smooth, finely controllable level of hypnosis with spontaneous respiration and avoidance of severe cardiorespiratory depression. It has an analgesic and sedative potential equal to that of the thiobarbiturates and a short reaction time without evidence of a pharmacologic hangover. It was adequate without additional premedication usually required in patients undergoing regional block anesthesia.

Two major drawbacks appeared. Three per cent of the patients had excessive spontaneous muscle activity, and patients having intraabdominal surgery required alert and vigilant airway management because packs, retractors, and position could compromise adequate ventilation.

Methohexital in continuous or intermittent dilute intravenous infusion was pleasant, safe, and practical, and its effects were readily reversible.

Accidental Use of Trichloroethylene (Trimar, Trilene) in a Closed System

Case Report

Anonymous. Anesth. & Analg. 43: 740-743 Nov.-Dec. 1964

A 62-year-old white man was admitted to a hospital complaining of pain in the left leg and left hip. The pain was of two weeks' duration and was worsening. The patient's own history, and that of his family, was not contributory.

The patient was well developed, well nourished, and not in acute distress. The outstanding finding was that of diminished femoral and dorsalis pedis pulses on the left side. The clinical impression was occlusion of the femoral artery, probably secondary to arteriosclerosis. Laboratory studies were all within normal limits, and the patient's electrocardiogram was normal.

Oscillometric studies confirmed the initial impression of decreased pulses in the left lower extremity. Aortography was carried out with the patient under halothane anesthesia and was tolerated well. This study revealed left femoral artery occlusion.

Surgery was planned to provide an aortic-femoral bypass. Preoperative medication comprised 30 mg. of promethazine, 75 mg. of meperidine hydrochloride, and 0.3 mg. of atropine sulfate. The patient was delivered to the surgery in a drowsy state.

Tetracaine hydrochloride was given spinally, and surgery proceeded. After

five hours, it was decided that general anesthesia would be efficacious in avoiding recurring, severe hypotensive episodes. The patient was intubated after being given succinylcholine, and anesthesia was maintained with halothane, nitrous oxide, and oxygen. After 45 minutes, the operation was concluded, without further incident. Because of absence of pulse in the right lower extremity, it was necessary to anesthesize the patient again. The patient vomited, but vomitus was aspirated. After transfusion of three units of blood required by a second, four-hour operation, the patient left the operating room in good condition. In the recovery room, his blood pressure increased to 214/120, with pulse 80 to 92. Six hours later, in his own room, the patient became disoriented, agitated, and had shallow respiration. Cyanosis appeared. Blood was given when the blood pressure began to fall rapidly. The patient became comatose and died ten hours after surgery had been completed.

Subsequently, it was discovered that trichloroethylene rather than halothane had been placed in the closed carbon dioxide absorption circle system.

This case report points out the necessity of vigilance to assure that this kind of error does not happen again. It also raises the question of how many potentially toxic anesthetic agents are required in an operating room? Can some of the presently available agents be discarded? Should there be an international color code for local anesthetic gases? These questions deserve thoughtful study.

Efficacy and Adverse Effects of Vasoconstrictors Used as Adjuncts in Regional Anesthesia

Stevenson, Arthur, Adriani, John, and Hyde, Edwin. Anesthesia & Analgesia 43:495-500, 1964

The terms vasoconstrictor and vasopressor denote the same class of drugs. Generally, vasoconstrictor implies that vasomotion is confined to a local region; vasoconstriction is sought in order to retard absorption of another drug, for hemostasis, or for decongestion of mucous membranes. Vasopressor is used to designate the systemic responses of the drug. The response is characterized principally by an elevation of blood pressure.

Today the combination of epinephrine and a local anesthetic is used extensively for infiltration, intrathecal, peridural, and topical anesthesia. Vasoconstriction extends duration of the blockade and averts or attenuates the systemic effects of the local anesthetic due to high plasma levels.

Studies designed to compare the effectiveness of vasoconstrictors were carried out with patients who required repeated saddle or low spinal block anesthesia. The effectiveness of the drugs used, in declining order, was epinephrine, norepinephrine, pitressin, phenylephrine, ephedrine, methoxamine, mephentermine, and metaraminol. Only the first three drugs in this list, and an investigative drug, PLV-2, are really effective. Angrotensin was ineffective.

Vasoconstrictors alone had no local anesthetic effect, local anesthetics also have no demonstrable vasoconstricting action. Adverse local effects to vasoconstrictors have been reported. Clearly the drugs should not be used in the presence of circulatory impairment. Adverse systemic effects are the result of the use of excessive quantities. Patients with cardiovascular disease should be treated carefully with vasoconstrictors.

Metabolism of volatile anesthetics

Van Dyke, Russell A. and Chenoweth, Maynard B.

Anesthesiology 26:348-357 May-June, 1965

For years, little has been known of the metabolism of inhalation anesthetics. In the belief that these agents were biologically inert, little effort was expended to justify or controvert this notion.

More recently, chemical activity has been held to have a role in narcosis. With sensitive methods unavailable to earlier investigators, studies using isotopes have shown that most of the known reactions occur intracellularly in microsomes and require the presence of nicotinamide adenine dinucleotide phosphate. The precise enzyme systems involved are not known.

Ethylene, a simple hydrocarbon, is degraded to carbon dioxide in part. The role of vitamin B_{12} in ethylene degradation and in the excretion of propylene is not known, except that the vitamin appears to be involved.

Cyclohexane is excreted unchanged (30 per cent), as hydroxylated and 1,2-dihydroxylated cyclopentane, and as carbon dioxide (10 per cent).

Ethers are metabolized. Diethyl ether is changed to acetaldehyde and ethanol. Acetaldehyde is reduced to ethanol, which is further degraded to carbon dioxide.

Halogenated hydrocarbons are dehalogenated. There is a sulfhydryl requirement; sometimes glutathione is necessary.

Carbon tetrachloride is known to be converted to chloroform, which is degraded to methylene chloride. Many pathways have been suggested for various halogenated hydrocarbons. Protein bonds appear to be involved; glucuronide complexes have been reported.

Halogenated ethers are degraded at the ether linkage and at the carbon-halide bond. NADPH and glucuronides are implicated. Little is known of the metabolism, if any exists, of inorganic anesthetics, including nitrous oxide, xenon, and krypton.

The relationship between toxicity of the anesthetic and its metabolism requires much study. Sixty-seven references are cited.

Studies on the specificity of narcotic antagonists

Foldes, Francis F., Shapira, Maximilian, Torda, Thomas A. G., Duncalf, Deryck, and Shiffman, Hans P.

Anesthesiology 26:320-328 May-June, 1965

It has been suggested that narcotic antagonists may exhibit group specificity, narcotic antagonists ability to counteract the respiratory depressant and other side effects of narcotics may be greater when the antagonist and the narcotic are closely related. This has been based on reports that nalorphine does not antagonize effects of meperidine hydrochloride.

Two hundred patients in good physical condition, who were to undergo elective surgery procedures, were studied. Thirty-one were male, 169 were female. Before anesthesia they were given 0.4 mg. scopolamine hydrobromide and 100 mg. pentobarbital sodium intramuscularly.

Forty patients each received 0.3 mg. morphine, 20 mg. oxymorphone, 50 mg. levorphan, 1.5 mg. meperidine, or 1.5 mcg. fentanyl per kg. body weight. In each group of 40, seven minutes after the narcotic was given, ten sub-

jects each received 150 mcg. nalorphine, 5 mcg. naloxone, or 20 mcg. levallorphan per kg. body weight. Ten were not given a narcotic antagonist.

Respiratory rate, depression of tidal volume, depression of minute volume, pulse rate changes, systolic blood pressure changes, and response to a painful stimulus were measured.

These studies indicate that each of the antagonists consistently antagonized the respiratory effects of each of the five narcotics.

Naloxone at 5 mcg./kg. was more effective than 150 mcg. nalorphine or 20 mcg. levallorphan per kg. body weight. None of the antagonists had any specificity for any of the narcotics. None was more effective against respiratory depression caused by structurally similar narcotics than against the four other narcotics.

Efficacy of the antagonist seemed to parallel the degree of narcotic depression. The antagonist's effect was chiefly on hypotensive and analgesic effect of the narcotics. Nalorphine interfered least with the analgesic effect; this effect of morphine was least disturbed by any of the antagonists.

Principles and practices of prescription writing

Friend, Dale G.
Clin. Pharmacol. Exptl. Therapy. 6: 411-416 May-June, 1965

Prescription writing began with an appeal to the gods for success. That is the significance of the R_X symbol, used at the start of prescriptions since ancient times. Use of Latin in prescription texts resulted from the need for complete understanding. This universal standard language was used uniformly on prescriptions until the turn of the last century. Abandonment of Latin has accelerated in the last twenty-five years because of lack of interest in the language and because desire for secrecy in prescriptions has diminished.

Use of the English language in prescriptions has permitted greater accuracy and fewer chances for error. The metric system is replacing the apothecary system for weights and measures.

Common abuses seen in prescription writing today include illegible writing. Poorly written prescriptions should be returned to the physician by the pharmacist. English should be used. The patient's name and initials should appear. Instructions to the patient should be clear and precise. The pharmacist should be told if refills are permitted, if the generic name should appear on the label, and if a generic-name preparation may be used.

Common errors include imprecise notations of quantity. Thus, say 500 mg. instead of 0.5 g., say 500 mcg instead of 0.5 mg. The amount to be dispensed should be sufficient for the patient's needs, but not excessive.

Instructions to the patient must be clear. Abbreviations should be avoided. Detailed instructions may necessitate a separate sheet, written to be dispensed with the drug.

The ingredients usually should be stated on the label. It may be desirable to permit non-proprietary or generic named preparations to be substituted for a brand-name drug. This must be noted on the prescription.

The cost of drugs to the patient should be considered by the prescriber. Physicians should not recommend particular pharmacies.

COMPONENT ROLL CALL

President Osterloh was recently reappointed Chairman of the Committee on Anesthesia of the American Society of Oral Surgeons in Denver. This is his second consecutive term as Chairman after having served as a member of this important committee for several years. This reflects the closer relationship between our Society and that of the Oral Surgeons which is continuing to develop to our mutual advantage.

ANNOUNCEMENT

Our Postgraduate Refresher Program MODERN TRENDS IN THE USE OF INTRAVENOUS AND INHALATION AGENTS FOR THE AMBULATORY PATIENT will feature Drs. Thomas W. Jones, Thomas W. Quinn and H. Cris Doku on February 14, 15 and 16, 1966. For further information contact Dr. L. Walter Brown, Jr., Director, Postgraduate Refresher Courses, Tufts University School of Dental Medicine, 136 Harrison Avenue, Boston, Massachusetts.

Drug Abuse Law Effective Feb. 1

The Drug Abuse Control Amendments Act of 1965, which provides for stronger nationwide controls over depressant and stimulant drugs, goes into effect next February 1.

Amendments provide for more stringent regulation of the manufacture, distribution, delivery and possession of such drugs as barbiturates, amphetamines and other psychotoxic drugs which have a potential for abuse because of their depressant or stimulant effects on the central nervous system or because of their hallucinogenic effect.

They do not apply to narcotic drugs, such as opium, morphine or heroin, which are regulated by the U.S. Treasury Department under another statute.

The new amendments also give the Food and Drug Administration stronger enforcement powers to prevent counterfeiting of drugs.

Beginning February 1, pharmacists must take an inventory of the designated depressant and stimulant drugs and keep their invoices and prescriptions for those drugs for a three-year period.

Pharmacists may maintain separate files on these drugs as they now do for narcotics. However, the new law permits them to keep prescriptions for stimulant and depressant drugs in their regular files if they wish.

Physicians who dispense these drugs will be required to keep records and make them available to Food and Drug Administration inspectors the same as pharmacists.

Stimulant or depressive drugs may be dispensed on telephoned or oral instructions from physicians. However, no prescription order can be dispensed or renewed more than five times or more than six months after being first prescribed.

When President Johnson signed the amendments last July, he lauded organized medicine, the drug industry and other groups for their support of the legislation.

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13th Annual Meeting

AMERICAN DENTAL SOCIETY OF ANESTHESIOLOGY

CONRAD HILTON, CHICAGO, ILL.

Sunday, Feb. 27, 1966

9:00 A.M. Introduction

9:15 A.M. Anatomy as related to problems in local anesthesia. Harry Sicher, M.D., D.Sc.

10:00 A.M. A review and evaluation of local anesthetics as related to clinical use. Stanley Harris, M.S., Ph.D.

11:00 A.M. Newer general anesthetic agents as applied to the ambulatory patient. Max Sadove, M.D.

12:15 P.M. Luncheon-Speaker — "Of Light & Lasers," Mr. Robert Stenson, Bell Telephone Co.

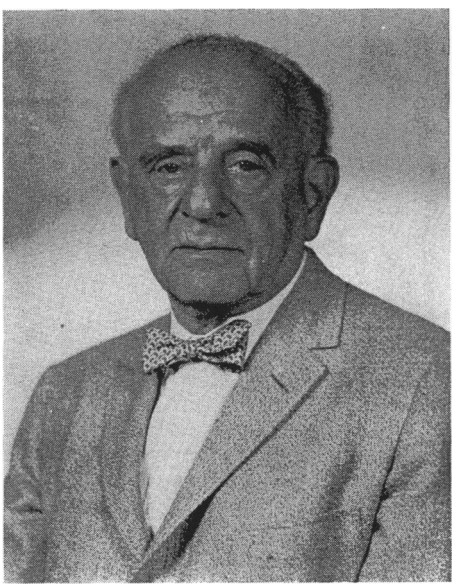
1:45 P.M. Inhalation analgesia. Its role in dental practice. Alvin Solomon, D.D.S.

2:30 P.M. Intravenous sedation: Its role in dental practice. Harold Marantz, D.D.S.

3:15 P.M. Panel discussion: Moderator
Program Chairman: Milton Jaffe, D.D.S.
Local Arrangements: Elaine Stuebner, D.D.S.

Introducing

HARRY SICHER, M.D., D.Sc.



Presently Dr. Harry Sicher is Professor Emeritus of Anatomy and Histology and Director of the Research Training Program at the Loyola University School of Dentistry.

Dr. Sicher came to Chicago from Vienna and served as Associate Professor of Anatomy at the Chicago Medical School from 1939 until 1942, when he joined the faculty of the Loyola University School of Dentistry. He served as Professor and Chairman of the Departments of Anatomy and Histology until 1960 when he received his present title. In 1952, Dr. Sicher received an honorary degree of Doctor of Science from Loyola University.

Dr. Sicher is the author of approximately 70 articles written in German and published in various journals before 1940. Since that time, he has written 46 English language articles which have been widely published. He is also author of *Oral Anatomy* and co-author of *Bone and Bones.* His books have become standard in the schools of the nation and he has become recognized as a world authority in his chosen field.

Dr. Sicher will speak on *Anatomy as related to problems in local Anesthesia:* A presentation which is a "must" for all disciples of dentistry.

Our Speakers

STANLEY HARRIS, Ph.D.
Stanley Harris, Ph.D.

Dr. Stanley Harris is currently Professor and Chairman of the Department of Physiology and Pharmacology at Northwestern University Dental School.

Dr. Harris will speak on local anesthetics as they relate to clinical use. Some of his present appointments and consultantships include membership on the National Board of Dental Examiners; the Council on Dental Therapeutics, (ADA); the Council on Drugs, (AMA); Board of Editorial Consultants, (ADA); Dental Advisory Panel, U.S. Pharmacopea; and Chairman of the Committee of Advanced Education, American Association of Dental Schools.

His unique background and interest in oral physiology and problems of the pharmacology of pain control make his participation in this conference an anticipated highlight.

NEW ADSA MEMBERS

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ANESTHESIA PROGRESS

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